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(54) Stain resistant

(57) The stain resistance of a textile material is improved by a method in which the textile material is coated with a curable silicone-based composition, partially cured, further coated with a curable silicone-based composition, and completely cured.

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Improvements in or relating to the treatment
of textile materials

This invention relates to the treatment of
textile materials and, more particularly, is concerned
5 with improving the resistance, of such materials, to
staining.

According to the present invention there is
provided a method of improving the stain resistance of
a textile material which comprises :-

10 (i) coating the material with a curable
silicone-based composition.

(ii) partially curing the composition coated
onto the material,

15 (iii) coating the partially cured composition
with further curable silicone-based composition, and

(iv) completing the curing of the composition.

It has been found that textile material
treated in accordance with the invention has
unexpectedly long lasting anti-stain properties.
20 Conventionally treated textile material tends to lose
its anti-stain properties after a short time
particularly if it is subjected to several treatments
with shampoo for cleaning purposes.

Any suitable curable silicone-based
25 composition may be used such as those which are
commonly used for imparting water proofing properties
to textile materials. Thus, for example, the
composition may comprise a reactive silicone oil
emulsion (such as Hydrophob SIK marketed by Rudolph
30 Chemicals of P.O. Box 749, D8192, Geretsried 2,
Germany) and a non-ionic organometallic curing agent
therefor (such as Catalyst KIS also obtainable from
Rudolph Chemicals).

The treatment is particularly suitable for
35 application to yarns intended for the production of

carpets. However, the treatment can also be carried out on yarn which has been made up into a carpet or the like. Preferably, the textile material is a keratinous material optionally admixed with a synthetic textile material. Thus, the invention is particularly useful for treating textile materials such as 100% wool yarn or an 80% wool/ 20% linear polyamide (nylon) yarn.

Prior to being treated in accordance with the invention, the textile material should be scoured to substantially remove oil. The material may then be processed e.g. dyed, as desired. It should then be washed to remove any surplus chemicals from the processing step. Then, the washed textile material is immersed in a bath containing an aqueous acid solution so that it become thoroughly wetted with the solution. Thereafter, the curable silicone-based composition is added to the bath. After allowing the textile material to be properly wetted with the liquor in the bath, the material is removed from the bath and the coating is allowed to become partially cured. Thereafter the textile material, coated with the partially cured composition, is immersed in a second bath, preferably, containing less acid and less silicone-based composition. After the textile material has been thoroughly coated with the composition, it is removed from the bath and the composition is then completely cured at elevated temperature.

It has been found that the use of a two-stage process in accordance with the present invention gives rise to textile material which retains its anti-soiling properties for a very much longer period of time than in the case where the composition is applied to the textile material in a single stage process.

The following Examples illustrate the invention.

Example 1

A 80% wool/ 20% nylon yarn was scoured to a residual oil content of 0.2% and was then dyed to a desired colour. 4% acetic acid 80 was heated to 45°C in
5 a suitable bath and the yarn was placed in the bath. The solution was allowed to circulate through the yarn for 15 minutes. 8% of a reactive silicone oil emulsion (Hydrophob SIK) was added to the bath liquor and the liquor was again allowed to circulate through the
10 material for 16 minutes. Thereafter 0.8% of a non-ionic organometallic compound (Catalyst KIS) was added and the bath liquor was again circulated through the material for a further 10 minutes. The textile
15 material was immersed in the bath and circulated until the liquor was exhausted. Thereafter the textile material coated with the silicone composition was removed from the bath and allowed to partially cure for 1 hour in air.

The process was then repeated using a bath
20 containing 4% Hydrophob KIS, 0.4% catalyst SIK and 4% acetic acid 80 until the bath liquor was again exhausted. The material was removed from the bath, washed in water at 30°C and then dried at 80°C until
25 the silicone composition had completely cured. The thus treated material had excellent anti-staining properties.

Example 2

A 100% wool yarn was scoured to a residual oil content of not more than 0.4% and then processed by
30 being dyed to a suitable colour. The dyed material was washed in a water bath to remove any surplus chemicals resulting from the dying treatment. 4% acetic acid 80 solution was then introduced into a bath and heated to 45°C and the yarn was circulated in the bath for 15
35 minutes. 5% of a reactive silicone oil emulsion

(Hydrophob SIK) was then added to the bath and the yarn was again circulated through the bath for 10 minutes to thoroughly disperse the oil. Thereafter, 0.5% of a non-ionic organometallic compound (Catalyst KIS) was
5 added and dispersed through the bath in a similar way. The yarn was immersed in the resultant emulsion and circulated through the bath until exhaustion of the bath liquor occurred. The coated yarn was then removed
10 from the bath and left at room temperature for 1 hour to partially cure the silicone-based composition on the yarn.

The above process was then repeated but using, in the bath, 3% Hydrophob SIK, 0.3% Catalyst KIS, and 1.5% acetic acid 80. After the bath liquor had been
15 exhausted, the coated yarn was removed from the bath and excess water was removed. The coated yarn was then heated to a temperature of 100°C to obtain complete curing of the silicone composition. Again, the treated
yarn had excellent anti-staining properties.

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CLAIMS:

1. A method of improving the stain resistance of a textile material, which method comprises:-
 - (i) coating the material with a curable silicone-based composition.
 - 5 (ii) partially curing the composition coated onto the material,
 - (iii) coating the partially cured composition with further curable silicone-based composition, and
 - 10 (iv) completing the curing of the composition.
2. A method according to claim 1 wherein the curable silicone-based composition comprises a reactive silicone oil emulsion and a non-ionic organometallic curing agent therefor.
- 15 3. A method according to claim 1 wherein the curable silicone-based composition is contained in aqueous acid solution.
4. A method according to claim 3 wherein in the second coating step the aqueous acid solution is less acidic, and the concentration of the curable silicone-based composition is lower, than in the first coating step.
- 20 5. A method according to any one of claims 1 to 4 wherein the textile material is a yarn.
- 25 6. A method according to claim 5 wherein the yarn is in the form of a carpet.
7. A method according to claim 5 or 6 wherein the yarn comprises a keratinous material.
- 30 8. A method according to claim 5 or 6 wherein the yarn comprises an admixture of a keratinous material and a synthetic textile material.
9. A method according to claim 8 wherein the keratinous material comprises wool and the synthetic material comprises a linear polyamide.
- 35 10. A method of improving the stain resistance of

a textile material substantially as described in Examples 1 or 2.

11. A textile material when treated according to the method of any preceding claim.